



Engineering Design
GNG1103[A]

Deliverable H: Prototype III and Customer Feedback

Team A15

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Abstract

A prototype is a way engineers can develop a test design of their project. There are many different types of prototypes that can be created including but not limited to analytical, mathematical, experimental and numerical. Prototypes are used to analyse and visualize the ideas created by the design team. It is used to evaluate different aspects of the project and is a way to weed out flaws and technical issues for the next prototype. Prototypes are created repeatedly until a refined final product is produced. The more prototypes that are produced, the more sophisticated they become.

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1.0 Introduction

In this report the changes between prototypes II and III are examined; in addition our test plan in relation to the prototype II test plan will be evaluated. This will be the final prototype of the JAMZ drone delivery for team A15. The reasoning behind each of the differences between the secondary and tertiary prototype will be analyzed in relation to the features that have been added or updated. Prototype III will undergo specific testing prior to the hand in date to try and weed out any possible issues that could dampen the user experience of the website. Feedback on prototype II given by the class, professor, and JAMZ will be used to strengthen prototype III.

2.0 Analysis of critical components

This Prototype concerns both user experience (UX) and performance. Firstly, the UX must be straightforward, the website must be visually appealing, and the pages must link correctly; the team took feedback from other students in the class, parents, friends and other potential users, noted their observations (see section 5.0) and made improvements on the website: for example, tweaking the color scheme for greater color contrast, making certain fonts larger, making the ordering process more intuitive, etc. Equally important is the performance and functionality of the website. For example, the website prompts the user to give permission to the browser to detect his location, and display restaurants around him, or, the map takes in an address and displays the restaurants around the input address. This Prototype must be able to integrate all subsystems and present an easy-to-use interface: the user must first log in, or sign up and log in, then, he will be brought to the ordering page, where he can order by cuisine (the website currently has four sample cuisines) or by restaurant using the map; after arriving at the restaurant page, he can add specific food items and use the cart to check out; after checking out, a confirmation email will be sent to the user and a QR code will be provided to the user for him to scan when the food arrives; finally, he will be able to provide feedback by filling out the survey to inform the team about the quality of the JAMZ service.

3.0 Justification, reasoning and explanation of tests

Like Prototype II, Prototype III is also very important: this Prototype is of high fidelity in appearance and functionality, in other words, this Prototype should look as close to the final product as possible; due to time constraints, some development mentioned in this Prototype may be continued beyond submission of this document. Some testing criteria and critical subsystems are discussed below; others are also found in Table 1.0.

First of all, the map must be fully functional. The stopping criterion is that when an address is input, the map shows the restaurant within the vicinity of the address. This feature is still being developed at the moment.

Secondly, the login and signup pages must be functional. The login and signup page is linked to a third-party Caspio database system, which offers free service that allows developers to directly

integrate into their own platforms. The ordering pages only appear after the customer logs in, and the website uses cookies to store user login status. The stopping criteria are that the signup information is stored correctly on the Caspio database, that the credentials can be used to log in successfully, that incorrect credentials are denied, and that the user only needs to log in once. Development on this feature has been completed.

Thirdly, the website must correctly determine the location of the drone and display an ETA of the delivery arrival. The data is calculated from a mathematical formula. The stopping criterion is that the website shows a correct ETA based on the distance between the delivery address and the current drone location. This feature is still being developed at the moment.

Fourthly, the website must notify users when the local weather does not permit a safe drone delivery. The website shows users the local weather, and displays a weather error message when the weather is unsuitable for the drone to fly. The stopping criterion is simply that the website does not provide service whenever the weather is bad. This feature is still being developed at the moment.

Fifthly, the website must only provide service after the user has agreed to the Terms and Conditions as outlined in the website, which can be modified to suit the customers' needs. This is to ensure that there will not be legal issues between the customers and the users; it is integrated into the signup database. Development on this feature has been completed.

Lastly, the website must send confirmation to users after an order has been placed. The website sends a confirmation email to the user containing the billing address, prices, ordered items. As well, it displays a QR code that will be scanned upon food arrival. Development on this feature has been completed.

4.0 Prototype III

Prototype III is the last prototype our group will produce; it is a culmination of all prior efforts and pages that represents our original vision in a working format. In our third prototype we fixed some of our functionality issues, since most of the features were already functional and visually aesthetic, we focused on the user's experience and what will occur after an order is placed. We ensured that navigation throughout our website for users was very straightforward by making all buttons and links clearly labeled and indicative of their purpose as well as having easily recognizable icons. Another major change to our website was also the fact we switched up the color scheme. Our prototype features a nearly complete website that only has a few missing features that can be corrected and enhanced on for design day as there is always something that can be improved on. Below is the team's test plan as well as the new features that were implemented or improved on (old features that were not updated were not included).

Table 1.0 Prototype III test plan and results description

ID	Test Objective (Why)	Description of Prototype Used and of Basic Test Method (What)	Description of Results to be Recorded and how these Results will be Used (How)
1	Ensure that the address search bar works for all locations and restaurants nearby appear.	Google maps search bar.	Test out many locations in Ottawa, ensuring the autocomplete works as well. Test nearby restaurants to see if they appear.
2	Test Caspio's database registration/ login system functions correctly.	Entering a sample user's info.	Record if the data entered by the user is accurate and doesn't leak private user information.
3	To ensure that the user's experience navigating the pages is straight forward,	Pages	Ask people to test out our website and ask for feedback about their experience(anything confusing and not straightforward)
4	To test that restaurants within the vicinity of service are shown on the map and that live tracking is available	Google Maps	Record if the maps are displayed correctly with the 10km radius
5	To ensure the aesthetics of the website are visually appealing to sample clients	Aesthetics	Receive feedback from different volunteers on their opinions of how the website actually looks (color palette, image size, image choice)
6	To ensure that the website only allows delivery service when the weather permits	Operating Weather Conditions	Ensure that the user is not able to order anything from the UI in the event that it is unsafe for the drones to operate due to weather conditions.
7	To ensure that all linkages to different cuisines concert to their specific restaurant lists and that all connections are valid	Order by cuisine	Make sure when you click on a cuisine there are no displayed errors and you can navigate cuisine options forwards and backwards, have sanity checks when pricing sample food.

8	To ensure the users address is properly shown in relation to the longitude and latitude the is used to compute the ETA	Location services and ETA	Make sure that the locations tried are actually accurate, this will be collected from getting different people in different places to test this feature and compare it to their coordinates
9	To ensure there are terms and conditions that the user must agree to before delivery is received, and order confirmation notification.	Terms and Conditions forms	Keep track of every user that agrees to terms and conditions for possible legal issues. This can be done by adding it to the database with the user's information.
10	Ensure a confirmation email is sent to user's after an order is placed.	Confirmation email	Test Sample orders and ensure an email is sent to the correct address, containing the proper order information (billing address, price, order and quantity)
11	Ensure Confirmation Page features is functioning	Confirmation Page	Test that a QR code is displayed with a print off option, and the ETA and get location are properly displaying distance
12	Ensure the weather notification is able to be toggled on or off and displays the local weather	Weather Page	Test that the weather warning appears on the homepage when toggled on. Also test that

Table 1 shows the test objectives, a description of the prototypes used and basic method test, a description of results and an estimation of the duration of the task to be performed. The team plans on performing these tests in an efficient and timely manner before design day. The team will ensure that testing is done by this time to ensure that our final product is fully functional.

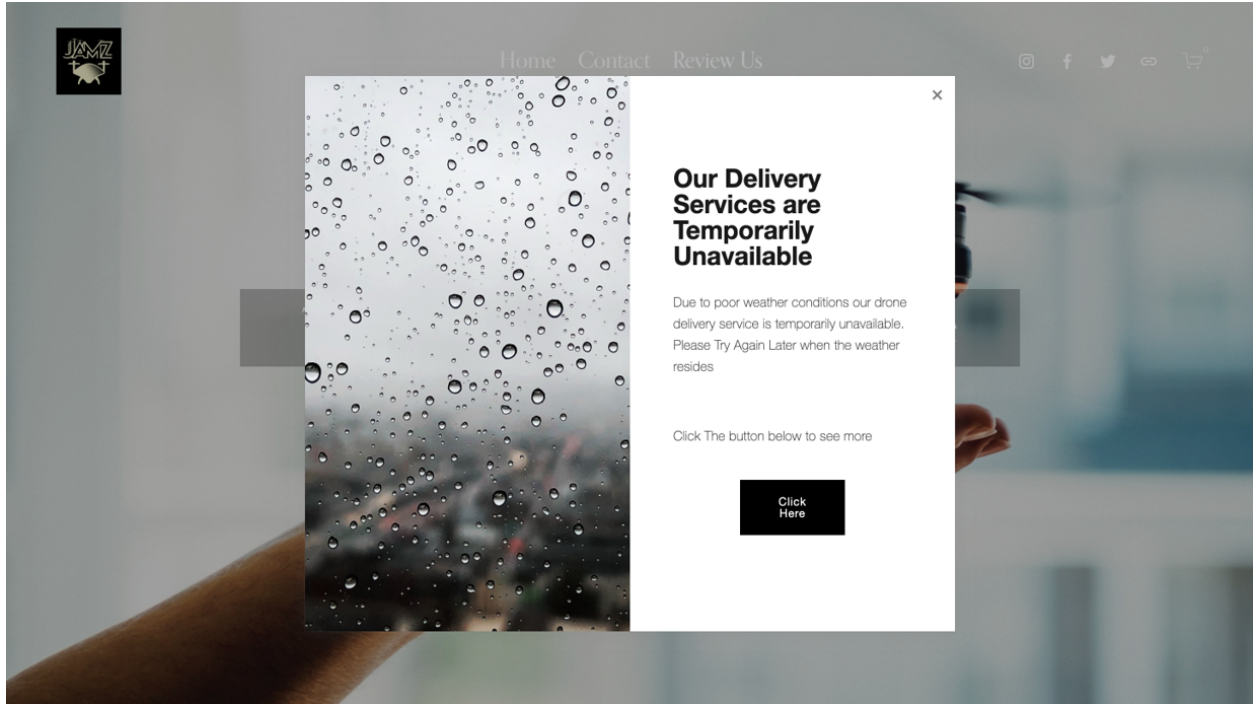


Figure 1.0: Updated delivery service delay notification

From prototype 1 to 2 we decided to update our weather disruption alert. In prototype 1 we had the weather disruption alert as an entire page but in prototype 2 we changed it to a pop up as seen in figure 1.



Figure 2.0: QR code that is displayed after an order is placed and after payment is completed

Figure 2 shows the QR code generator that is unique to every order. Once an order is placed the user will receive a confirmation email which contains a link to the page with the QR code generator. The QR code is to be shown to the drone once the order has arrived at the customers door. This page can also be found through this link:

<https://jamz-drone-delivery.squarespace.com/order-confirmation>.

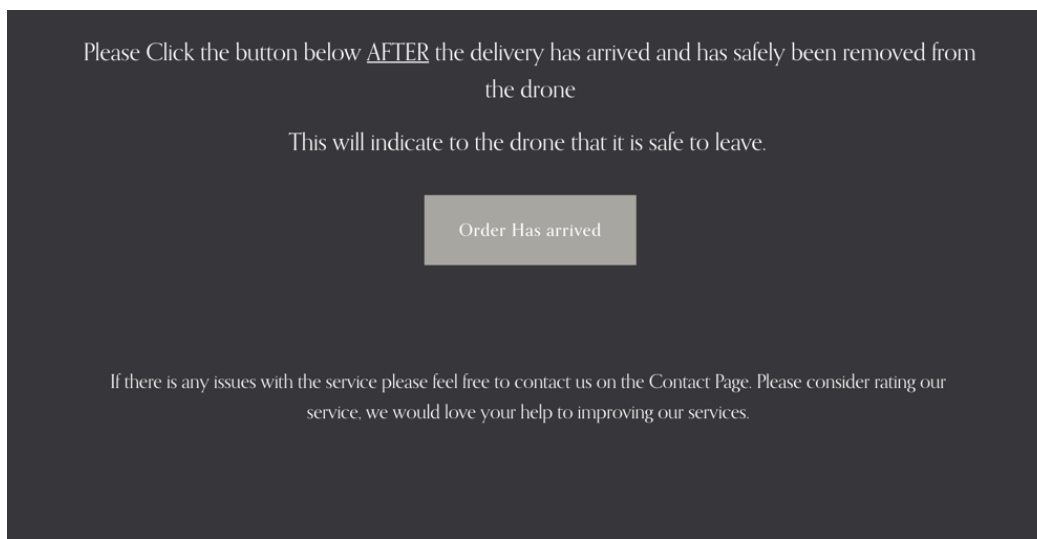


Figure 3.0: Drone has arrived customer prompt

Figure 3 displays a button for the users to press after the delivery since the drone is fully autonomous it's important that the user indicates that the delivery has been taken off the drone and the drone can proceed to return to the restaurant. There are also instructions clearly explaining when to press the button.

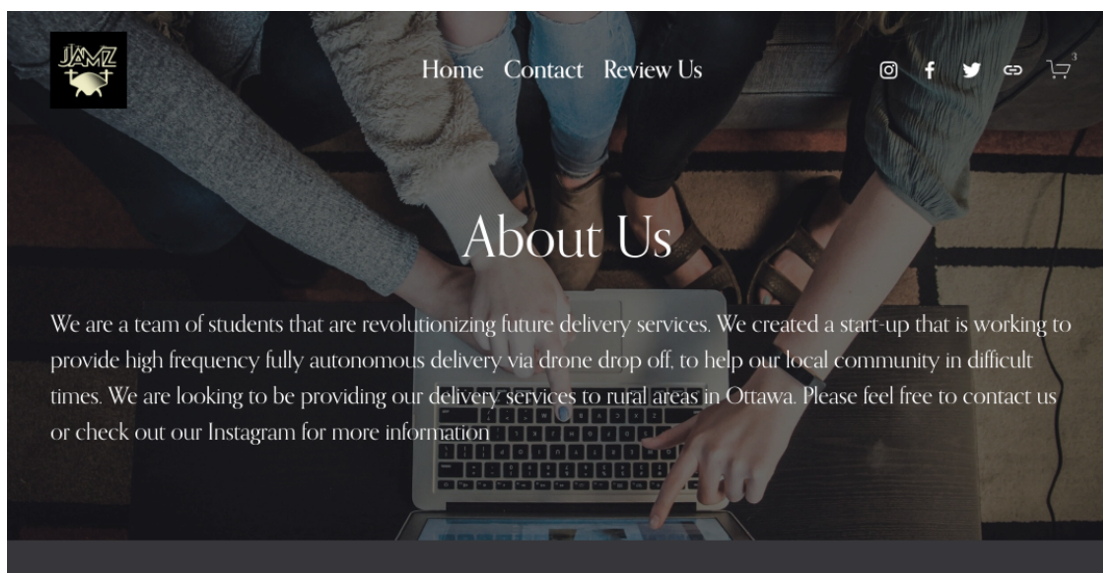


Figure 4.0 The about us page where the customer can learn about the team

Figure 4 shows the about us page that we choose to add to our webpage.

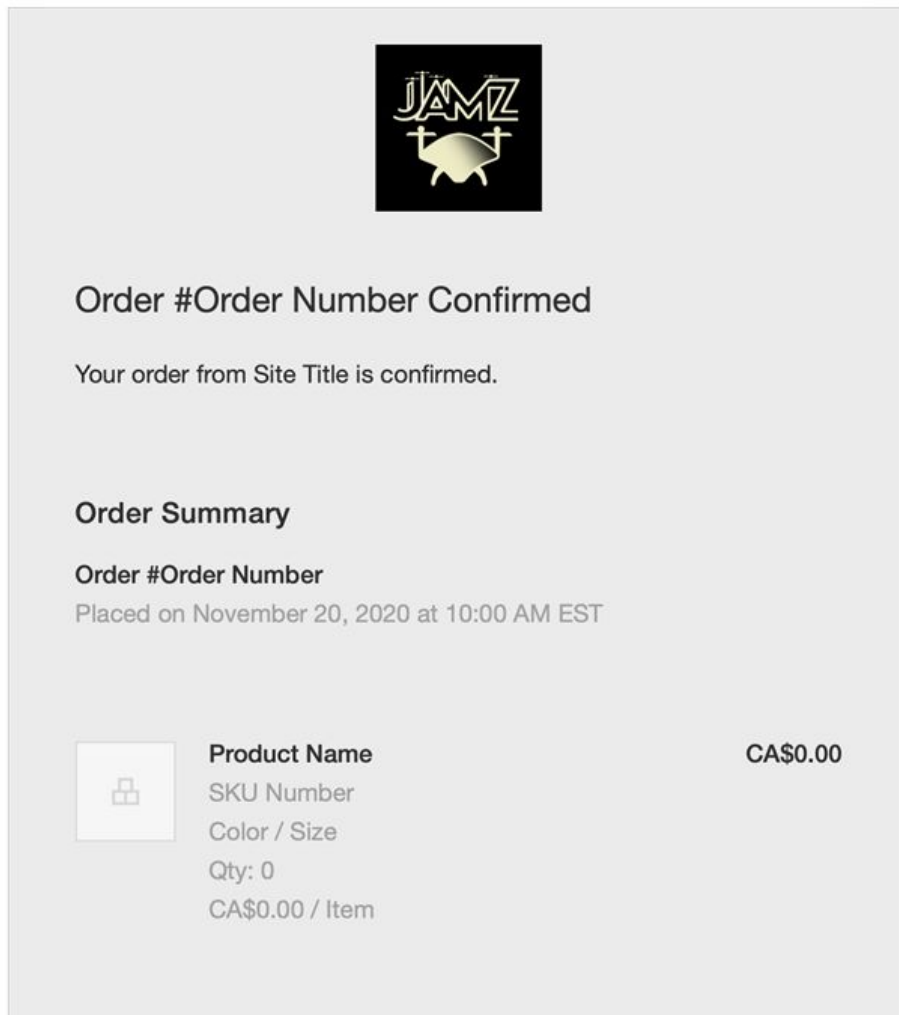


Figure 5.0 Email confirmation

Figure 5 shows the first part of the email upon delivery. It gives an order number and a summary of what you bought.

Customer Information

Shipping Address Customer Name Street Address City, State, ZIP/Postal Code Country	Shipping Method Shipping Method
Billing Address Customer Name Street Address City, State, ZIP/Postal Code Country	Payment Method Payment Method

Click here to get your QR Code that you must show to drone upon arrival:

<https://jamz-drone-delivery.squarespace.com/qr-code-generator>




  

Figure 6.0 Email confirmation cont.

Figure 6 shows the final part of the email received upon purchase. It stores a link that will lead you to the estimated time of arrival page and the QR code generator.

Product Name	CA\$0.00
SKU Number	
Qty: 0	
CA\$0.00 / Item	
Subtotal	CA\$0.00
Shipping	CA\$0.00
Sales Tax	CA\$0.00
Total	CA\$0.00
Amount Paid	CA\$0.00

Figure 7.0 Email confirmation cont..

Figure 7 shows a summary of the purchases made on the website.

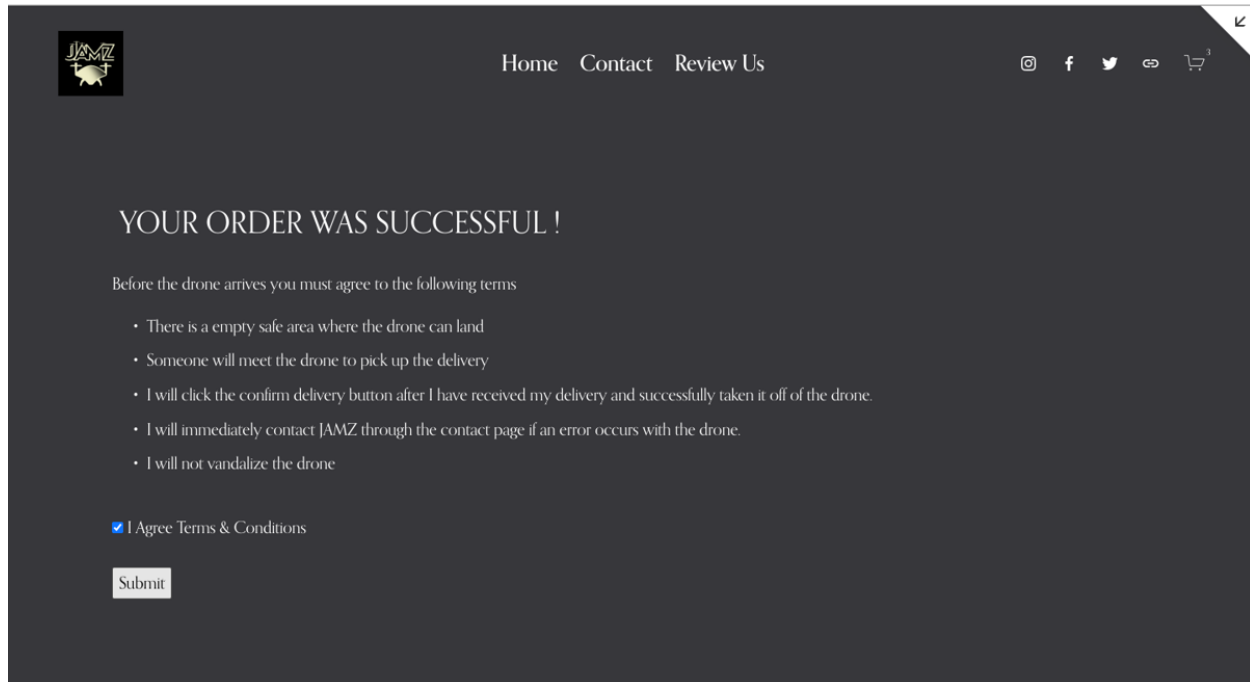


Figure 8.0 Terms and conditions that must be filled in by the customer after an order is placed
 Upon purchasing stuff from the website, a list of terms and conditions will appear that must be checked for the delivery to happen. This ensures legal protection.



Figure 9.0 this button displays the restaurants in the surrounding allowed radius

Figure 9.0 shows the place to click to see restaurants are nearby.

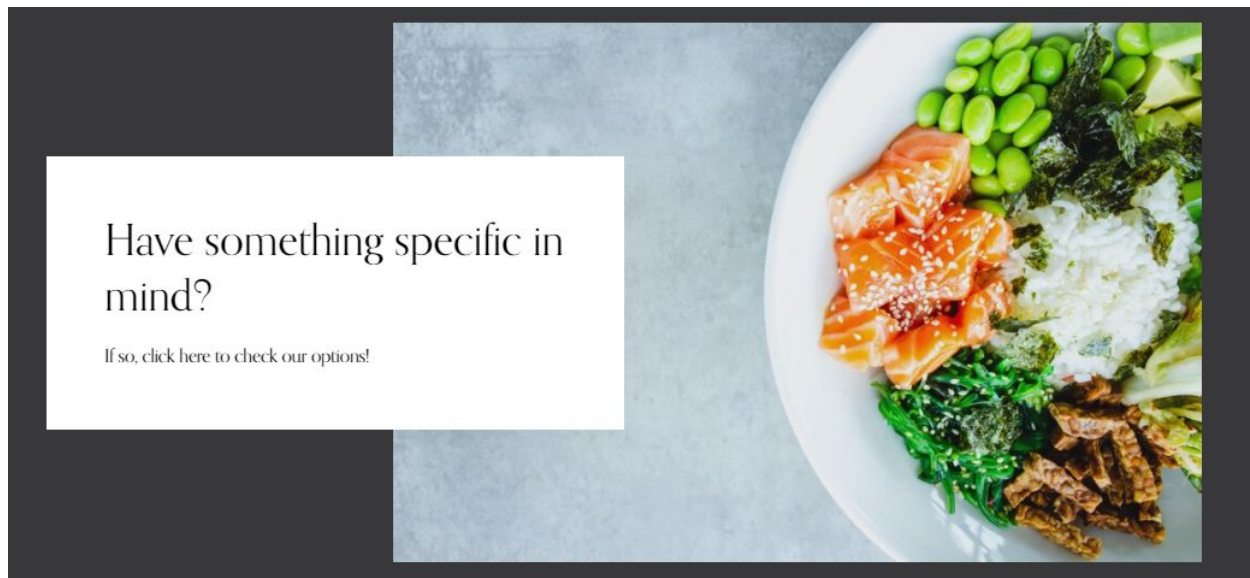


Figure 10.0 the explore feature lists the premade restaurants

Figure 10 shows the place to click to view premade restaurants, and how everything would appear.

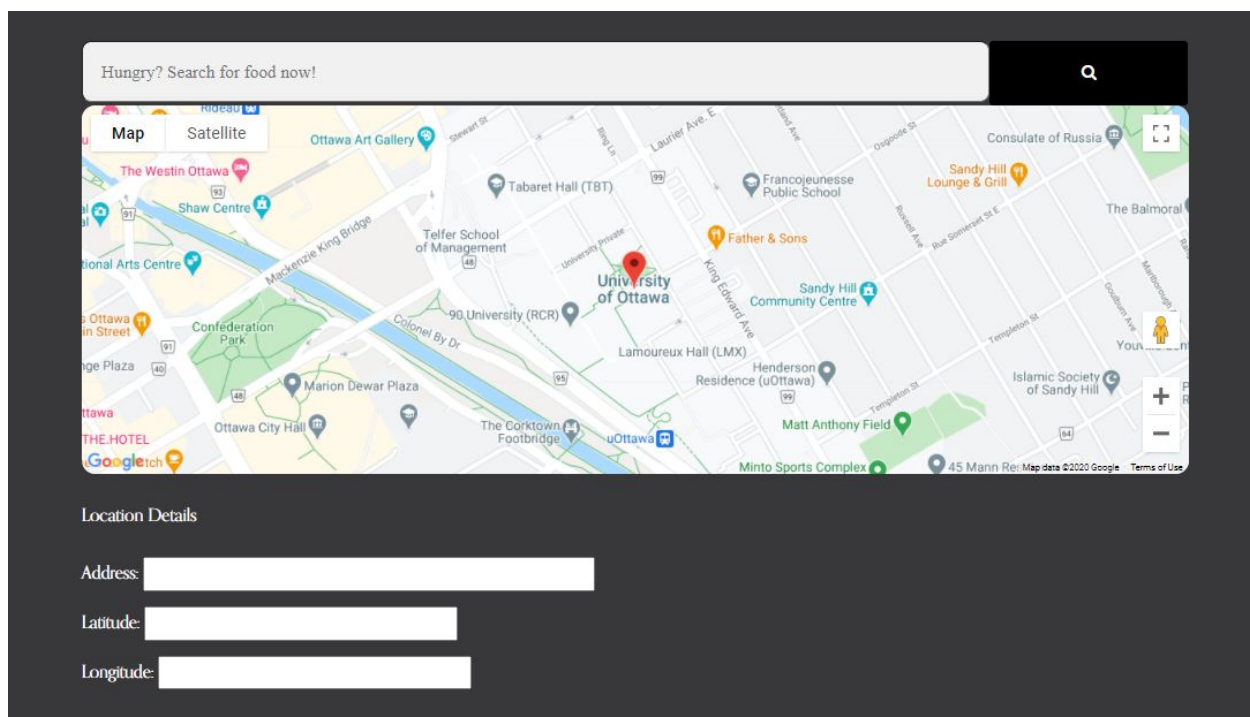


Figure 11.0 Search function that displays the map of restaurants and find your location

Figure 11 displays the search function to view your location on a map. Also displays available restaurants in a 10 km radius from the searched location. Location Details such as longitude and latitude are displayed below.

5.0 Feedback and comments

Prototypes need feedback in order to implement missing features, get feedback on current features and to enhance the UX (user experience). To do so, the team sent out a survey consisting of three questions:

1. Is the website intuitive?
2. How good is the color scheme of the website?

And finally, the most important question: feedback.

3. What are some recommendations to improve the website?

These questions were sent out previous to the second prototype to evaluate what people thought of the current user experience, how it could be improved and any changes they could recommend. These questions were sent to students, parents of these students and elderly. This was done in order to get a collective understanding of what people think (i.e. get feedback from young people as well as older people) as the tech gap between these groups is significant, and the website needs to fulfill the needs of these different groups.

Before beginning the third prototype, the team decided to send out the same questions, to the same audience, to check if the changes were helpful or not and if new additions needed to be made.

5.1 Is the website intuitive

Prototype II

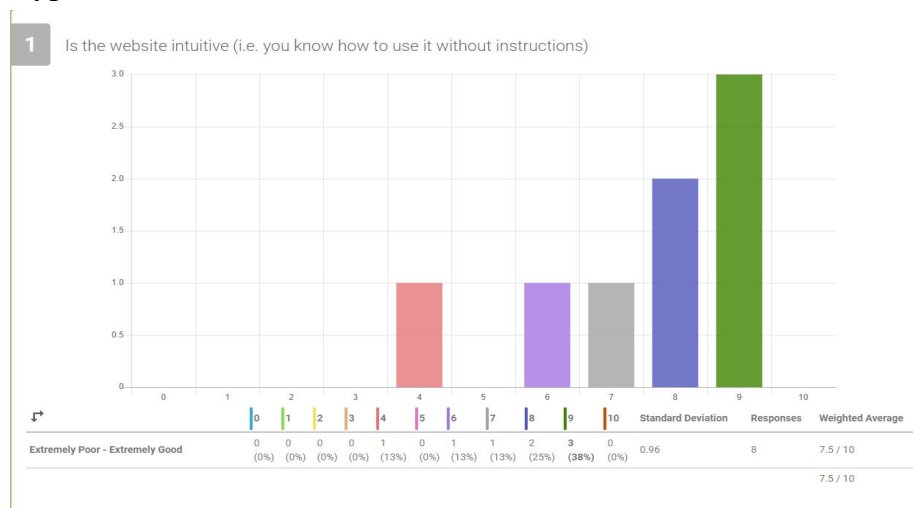


Figure 12.0: Is the Prototype II website intuitive

Looking at the results, it was concluded that the website was fairly intuitive to use, with a good amount of people giving a 9 out of 10.

Prototype III

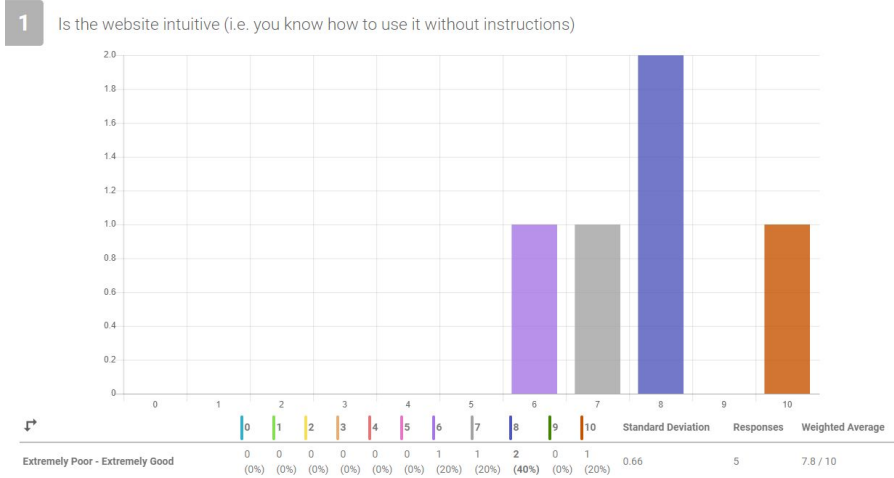


Figure 13.0: Is the Prototype III website intuitive

An improvement can be seen between both (average from 7.5 to 7.8). The website was improved for usability between these prototypes. Buttons were changed place, colors made clear and where to click to change pages was indicated.

5.2 How good is the color scheme of the website?

Prototype II:

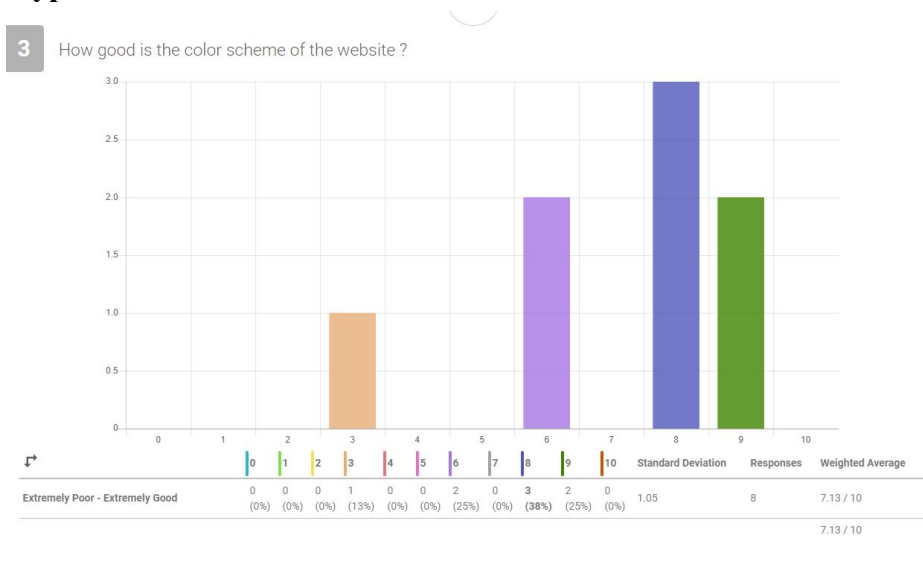


Figure 14.0: Colour scheme feedback for prototype II

The feedback showed that the color scheme of the website was not good.

Prototype III:

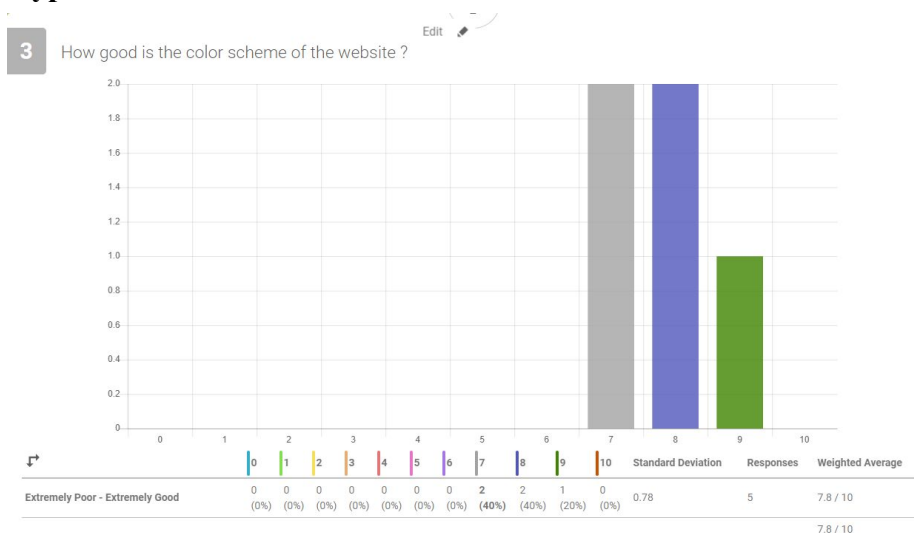


Figure 14.0: Colour scheme feedback for prototype III

Previously, the color scheme was poorly rated, averaging just over 7 out of 10. In the third prototype, an improvement was seen, nothing below 7 stars was given and the average rating went up to 7.8/10. The changes of color in the order page were well received.

5.3 What are some recommendations to improve the website?

Prototype II:

4 What are some recommendations to improve the website (aesthetics, function, bugs etc.)

Some text colors should be changed to look better on the backgrounds

Sometimes the website is very good looking and at other time it shows that you coded some parts. Integrate it better

create an interactive map

Potentially more guidance on how to use the website

It is not clear where to order when you get unto the website. You need to figure out that you need to login beforehand.

For color scheme: Sometimes the words are hard to read, like pale colors over pale backgrounds

Better color scheme

Show recent 5 | All

Figure 15.0: Prototype II recommendation

Comments made for the second prototype

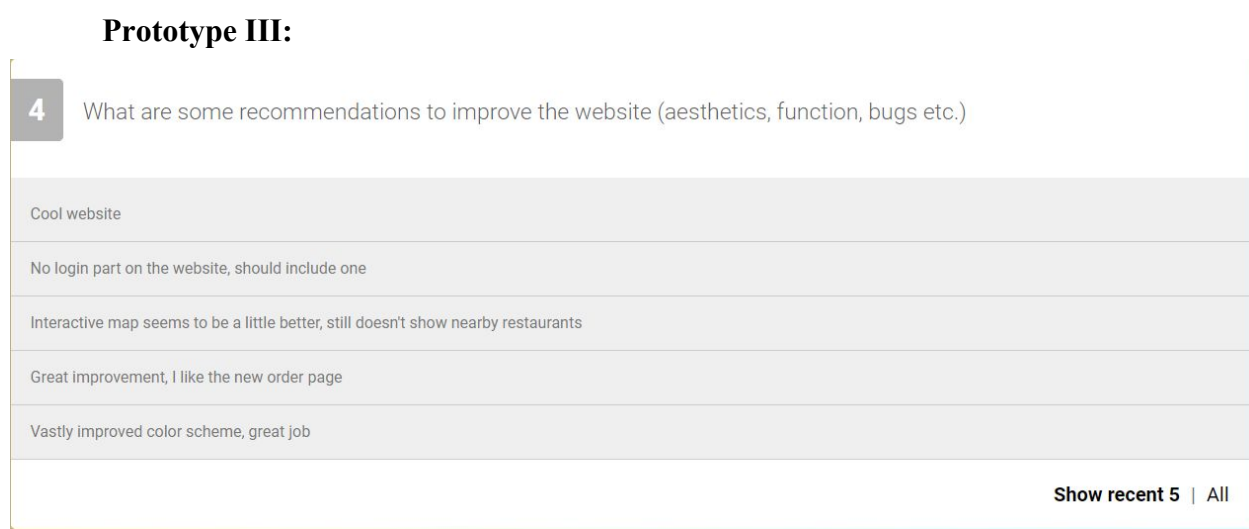


Figure 16.0: Prototype III recommendations

Some improvements were still asked to be made. However, it appears that some people who took both surveys saw an improvement (e.g. color scheme improved and enjoying the new order page).

6.0 Conclusion

This document concerned the third prototype. The feedback that the team receives will be of significant help to develop the finished version of the website for design day. This document also outlines the features and functions of the website in prototype III along with the explanation of the types of prototype modeling used. The test plan outlines what will be done to test each of the elements of the code to see if the features work in the way they were intended upon. From here the items can be modified to properly suit the needs of the client. The feedback the team received from the peers was also evaluated. Images of the implemented features were also included.

7.0 Code used in website

Haversine formula template:

jsfiddle.net/edgren/gAHJB/.

Ask location template:

jsfiddle.net/deepumohanp/a4g2J/.

Timer countdown:

<https://www.sitepoint.com/build-javascript-countdown-timer-no-dependencies/>

QR Code Generator:

<https://www.studytonight.com/post/javascript-qr-code-generator>

Weather Location:

<https://ibooked.ca/weather/ottawa-30552>

<https://www.booked.net/widgets/weather>

8.0 References

Caspio. (2020, October 02). Build Online Database Apps - Low-Code Platform. Retrieved November 13, 2020, from <https://www.caspio.com/>

¹User1921user1921. (2008, September01). Calculate distance between two latitude-longitude points? (Haversine formula). Retrieved November 11, 2020, from <https://stackoverflow.com/questions/27928/calculate-distance-between-two-latitude-longitude-points-haversine-formula>.

Yaphi Berhanu, N. J. (2020, June 01). Build a Countdown Timer in Just 18 Lines of JavaScript.

<https://www.sitepoint.com/build-javascript-countdown-timer-no-dependencies/>

JavaScript QR Code Generator. (n.d.). Retrieved November 27, 2020, from <https://www.studytonight.com/post/javascript-qr-code-generator>

¹ *** The author is actually User1921user1921, it is not a mistake.